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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,454	01/27/2004	Tatsuhiko Saitoh	50395-247	8678

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EXAMINER	
DEHGHAN, QUEENIE S	
ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/764,454	SAITOH ET AL.	
	Examiner	Art Unit	
	Queenie Dehghan	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimondi et al. (2005/0072192) in view of Nagayama et al. (2002/0059816 and 6,400,878) and Suzuki et al. (2003/0126891). Regarding claims 1 and 2, Arimondi et al. disclose a method for preparing an optical fiber perform having through holes to be formed into air holes and drawing the optical fiber perform into a fiber with the air holes ([0001], [0005], [0026], figure 1). In the drawing step, Arimondi et al. disclose pumping a hydrogen free gas into the through holes of the preform during drawing ([0115]). However, Arimondi et al. fail to specifically disclose the presence of oxygen gas in the

through holes when drawing the optical fiber preform. Suzuki et al. teach a process for drawing optical fiber preform and discuss the formation of SiO gas during the drawing process ([0004]). More specifically, Suzuki teaches SiO gas is produced when a silica preform is heated to a high enough temperature, such as a drawing temperature. One skilled in the art would the SiO gas to adhering to the surfaces of the fiber as well as present in the atmosphere. Suzuki et al. also teach that it is necessary to suppress the formation of the SiO gas by using oxygen gas while drawing ([0016], [0018]). It would have been obvious to one of ordinary skill in the art at the time of the invention to have expected SiO gas to be produced on and adhering to all surfaces of the optical fiber of Arimondi, outside surface of the fiber and inside surfaces of the air holes, during the drawing of the fiber since Suzuki teaches that the production of SiO gas is naturally produced when an optical fiber preform is heated to drawing temperatures, as it is done in the process of Arimondi. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize oxygen in the air holes of the optical fiber preform of Arimondi et al. since Suzuki teaches that oxygen will prevent the sublimation of SiO that is formed during drawing of optical fibers.

4. Also, Arimondi et al. do not disclose a third step of heating the optical fiber in an additional furnace. However, Suzuki et al. teach an additional heating step after drawing for stabilizing the SiO present, either adhering to the surface of an optical fiber preform and/or in the atmosphere surrounding the drawn preform as depicted in section F of figure 1 ([0004], [0013]). Although the additional heating of Suzuki is provided downstream of the drawing furnace, it is not a furnace specifically. Nagayama et al.

(878) teach of a step of heating the optical fiber in an additional heating furnace located downstream of a drawing furnace (col. 5 lines 46-48) to a temperature of 1100°C for 3 seconds (col. 12 lines 64-67). Nagayama teaches the annealing of the fiber in the heating furnace would prevent the drawn fiber from cooling drastically and thereby suppressing Rayleigh scattering intensity (col. 1 lines 32-39, col. 2 lines 47-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat the fiber of Arimondi in an additional heating furnace to 1100°C for 3 seconds in an additional furnace in order to ensure the stabilization of SiO gas present on the fiber surfaces and to reduce Rayleigh scattering losses, as taught by Suzuki and Nagayama et al.

5. Regarding claims 3 and 4, Arimondi et al. do not disclose a minimum temperature of the fiber between the drawing and heating furnaces. Nagayama et al. (816) teach the use of two furnaces, a drawing and heating furnace, for forming an optical fiber, where an optical fiber usually cools to about 400°C after being drawn ([0010]). Furthermore, Nagayama et al. teach cooling the fiber with air between the drawing and heating furnaces ([0058]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat the fiber to 1100°C as mentioned in claim 1, which is higher than the air-cooled down temperature of 400°C, as disclosed by Nagayama et al. in order to properly anneal the fiber.

6. Regarding claims 5 and 6, Nagayama et al. (816) teach of a drawing furnace filled with helium gas and a heating furnace filled with nitrogen gas ([0058], [0063]). It would have been obvious to one of ordinary skill in the art at the time the invention was

made to use helium gas in the drawing furnace and nitrogen gas in the heating furnace, as taught by Nagayama et al. in the drawing process of Arimondi et al. and Nagayama et al. (878), in order to provide the atmospheres needed to soften and anneal the glass fiber with a lowered transmission loss and whose outer diameter is restrained from fluctuating, as taught by Nagayama et al.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arimondi et al. (2005/0072192) in view of Nagayama et al. (2002/0059816 and 6,400,878) and Suzuki et al. (2003/0126891), as applied to claim 1 above, and further in view of Kuwahara et al. (2002/0174692). Arimondi, Suzuki and Nagayama do not disclose a drawing temperature. Kuwahara et al. teach of drawing step at 1950°C. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the drawing temperature of Kuwahara et al. in the fiber making process of Arimondi et al. and Nagayama et al. in order to properly soften the glass for drawing.

Response to Arguments

1. Applicant's arguments filed May 23, 2008 have been fully considered but they are not persuasive. The applicant argues Suzuki does not teach the production of SiO gas in the air holes of fiber, such as Arimondi and that SiO gas adheres to the air holes. The Examiner disagrees. Suzuki clearly teaches that an optical fiber preform, when heated to drawing temperatures, produces SiO gas. One of ordinary skill in the art would expect that the production of SiO gas is not limited to just an outside surface of the preform, but instead would occur for any surface of the preform that is heated

sufficiently. That is to say, if a preform is a solid rod, then the only surface present is the outside surface. However, if a preform has air holes, then the surface of the air holes which is also heated in a drawing furnace to a drawing temperature would also produce SiO as well as the outside surface. Furthermore, in an atmosphere of SiO gas, the surfaces of the preform, inside and outside, would have some SiO adhering to it, especially since the drawing process is not performed in a vacuum.

2. The applicant further argues the applicability of Nagayama '878. More specifically, Nagayama does provide any basis to modify Arimondi. As clarified in the rejection above, Suzuki teaches an additional heating step to stabilize SiO. Nagayama similarly teaches an additional heating step requiring a heating furnace located downstream of the drawing furnace and the subsequent reduction of Rayleigh scattering as a result of added heating step. Based on the teaching of Suzuki to employ an additional heating step, Nagayama teaches achieving the heating with a heating furnace. Therefore, the combination of Suzuki and Nagayama clearly teaches to modify the process of Arimondi with a third heating step.

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Queenie Dehghan whose telephone number is (571)272-8209. The examiner can normally be reached on Monday through Friday 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit 1791

Q Dehghan